

DIVISION 6 — CARPENTRY

Section 06600: Fiberglass Reinforced Plastic (FRP) Products

**SECTION 06600: FIBERGLASS REINFORCED PLASTIC (FRP) PRODUCTS**

PART 1 –GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

1.02 SUMMARY

This section includes the following FRP products and fabrications:

- A. FRP Gratings and Frames
- B. FRP Gritted Plate

1.03 SCOPE OF WORK:

- A. Furnish all labor, materials, equipment and incidentals necessary to install the fiberglass reinforced plastic (FRP) products as specified herein.

1.04 QUALITY ASSURANCE:

- A. The material covered by these specifications shall be furnished by a reputable and qualified manufacturer of proven ability who has regularly engaged in the manufacture and installation of FRP systems.
- B. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.05 DESIGN CRITERIA:

- A. The design of FRP products including connections shall be in accordance with governing building codes and standards as applicable.

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- B. Design of FRP live loads on grating shall not be less than 100 pounds per square foot. Also, grating shall be designed to resist a concentrated load of 1500 pounds applied to a 6 inch by 6 inch square, or an axle load of 3000# with a center-to-center axle spacing of 5' 0". Concentrated load need not be applied simultaneous to uniform load. Grating deflection at the center of a simple span not to exceed .25 inch.

#### 1.06 SUBMITTALS:

- A. Manufacturer's catalog data showing:
  - 1. Dimensions, spacings, and construction of grating
  - 2. Design tables showing limits for span length and deflection under various uniform and concentrated loads
  - 3. Materials of construction
- B. Samples of each type of product proposed shall be submitted for approval prior to placement of purchase orders.

#### 1.07 SHIPPING AND STORAGE INSTRUCTIONS:

- A. All systems, sub-systems and structures shall be shop fabricated and assembled into the largest practical size suitable for transporting.
- B. All materials and equipment necessary for the fabrication and installation of the grating and stair treads shall be stored before, during and after shipment in a manner to prevent cracking, twisting, bending, breaking, chipping or damage of any kind to the materials or equipment. Any material which in the opinion of the Owner, has become damaged as to be unfit for use, shall be promptly removed from the site of work, and the Contractor shall receive no compensation for the damaged material or its removal.

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#### PART 2 –PRODUCTS

##### 2.01 GENERAL:

- A. Materials used in the manufacture of the FRP products shall be new stock of the best quality and shall be free from all defects and imperfections that might affect the performance of the finished product.
- B. All FRP products noted in 1.02 shall be manufactured using a pultruded process utilizing either an isophthalic polyester or a vinyl ester resin with flame retardant and ultra-violet (UV) inhibitor additives. A synthetic surface veil shall be the outermost layer covering the exterior surface. The FRP shapes shall achieve a flame spread of 25 or less in accordance with ASTM method E-84.
- C. After fabrication, all cut ends, holes and abrasions of FRP shapes shall be sealed with a compatible resin coating to prevent intrusion of moisture. Bevel sharp edges prior to coating.
- D. FRP products shall contain an ultraviolet inhibitor; in addition a one mil minimum U.V. coating shall be applied.
- E. All exposed surfaces shall be square, flat and true to form.

##### 2.02 GRATINGS:

###### A. General

- 1. Grating shall be Duragrid I-4000 as manufactured by Strongwell, or approved equal.
- 2. Grating shall be shipped from the manufacturer, palletized and banded with exposed edges protected by cardboard to prevent damage in shipment.
- 3. Each piece shall be clearly marked showing manufacturer's applicable drawing number.

###### B. Design

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1. The panels shall be 1.50 inches deep, and bearing bars shall be located at 1 inch on center. The maximum gap between bars shall be 0.40 inch.
2. The bearing bars shall be joined into panels by passing continuous length fiberglass pultruded cross rods through the web of each bearing bar at maximum 12 inches on center, and 3 inches maximum to the end of any panel. The pultruded cross rod assembly shall consist of two cross rod spacers that have notches cut into them to fit the distance between the web of each bearing bar, and a continuous fiberglass pultruded bar shaped section wedged between the two cross rod spacers, mechanically locking the notches in the cross rod spacers to the web of the bearing bars. Continuous chemical bonding shall be achieved between the cross rod spacers and the bearing web and between the bar shaped wedge and the two cross rod spacers locking the entire panel together to give a panel that resists twist and prevents internal movement of the bearing bars.
3. The top surface of all panels shall have a nonskid grit affixed to the surface by an epoxy resin followed by a top-coat of epoxy resin.
4. Panels shall be fabricated to minimize the number of joints. Panels shall be continuous full length, except that panel length need not exceed 16'0". Panel splices shall be centered on a support.
5. Hold down clamps shall be type 316L stainless steel saddle clips, hidden style, at locations shown on drawings (four minimum per panel).
6. Color shall be dark gray to match existing FRP grating placed on nearby sections of the Whatcom Creek Trail.

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7. All bearing bars shall be coated with polyurethane coating with a minimum thickness of 1 mil.
8. Surface grit shall be standard (medium) grit to match existing.

#### 2.03 FRP GRITTED PLATE

##### A. Design

1. Product shall be SAFPLATE. SAFPLATE shall be EXTREN as manufactured by Strongwell. Plate thickness shall be .25 inch.
2. SAFPLATE shall be manufactured using a premium grade polyester or vinyl ester resin with fire retardant additive to meet Class 1 flame rating of 25 or less as tested by ASTM E-84 and meet the self-extinguishing requirements of ASTM D-635. All plate shall contain a U.V. inhibitor; in addition a one mil. minimum U.V. coating shall be applied.
3. SAFPLATE shall have a non-skid grit surface affixed to the top of the plate by epoxy resin, followed by a top coat of epoxy resin.
4. Panels shall be fabricated to the sizes shown on drawings.
5. Segments requiring seams shall be fastened at both ends of the plate sections with a maximum spacing of 3 inches from either end of the plate.
6. Plate shall be secured using Stainless Steel screws as shown on the structural drawings. All holes shall be pre-drilled prior to installation of fasteners; installation of fasteners to be flush with the plate surface. See drawings for minimum dimensions and layout of fasteners.
7. Color shall be dark gray; color and surface texture to match the grating specified above.

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#### PART 3 –EXECUTION

##### 3.01 PREPARATION:

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including anchor bolts. Coordinate delivery of such items to project site.

##### 3.02 INSTALLATION, GENERAL:

- A. Cutting, fitting and placement: Perform cutting, drilling and fitting required for installation of miscellaneous FRP fabrications. Set FRP fabrication accurately in location, alignment and elevation; with edges and surfaces level, plumb, true and free of rack; and measured from established lines and levels.
- B. Screw fasteners for the SAFPLATE shall be stainless steel flat head screws with the head flush with the surface.
- C. Provide temporary bracing or anchors in form work for items that are to be built into concrete masonry or similar construction.

##### 3.03 ALL FRP INSTALLATION:

- A. All field cut and drilled edges, holes and abrasions shall be sealed with a catalyzed resin compatible with the original resin as recommended by the manufacturer. Color to match the grating. The sealing of the edges shall prevent premature fraying at the field cut edges and prevent moisture ingress. All unsupported cut ends of grating shall be provided with a 1/4 inch by 1½ inch fiberglass angle edge band, as manufactured by the FRP manufacturer, to be adhered with methods and materials recommended by the manufacturer.
- B. Install items specified as indicated and in accordance with manufacturer's instructions.

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**END OF SECTION 06600**